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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,782	11/05/2003	Ronald Patrick Huemoeller	G0092-7P	7434

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EXAMINER	
SEMENENKO, YURIY	

ART UNIT	PAPER NUMBER
2841	

DATE MAILED: 06/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/701,782	HUEMOELLER ET AL.	
	Examiner	Art Unit	
	Yuriy Semenenko	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18, 21 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Amendment filed on 3/27/2005 has been entered.

In response to the Office Action dated 2/08/ 2006, Applicants has amended claims 1, 9, 10, 14 and 17

Claims 19 and 20 have been cancelled.

Claims 1-18 and 21-22 are now pending in the application.

Specification

2. The Specification amendments, filed on 3/27/2006 accordingly with examiner's objection is acknowledged and approved.

Claim Objections

3. The Claims amendments, filed on 3/27/2006 accordingly with examiner's objection is acknowledged and approved.

Response to Arguments

4. Applicant's arguments are considered and acknowledged but they are not persuasive.

Applicant argues that prior art's pad is not a land, claimed in application. Independent claims 1, 9 and 17 teach "wherein the channels include at least one land area formed from multiple channels within the substrate ". Such land (pad) is taught by Gebhardt as follow : the channels include at least one land area formed from multiple channels (land on intersection of channels (grooves)) 93 and 84 within the substrate 80 (see at top of

Fig. 4). Takeuchi discloses in Fig. 1 the at least one land area 10 forms a shape having non-channel regions 12 within a perimeter of the land area 10. So Takeuch teaches sape having non-channel regions same as claimed by applicant.
A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.
Further, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). In this case, the prior art sets forth all of the structural limitations of the claims as explained in the rejections below.
And furthermore, applicant cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5.1. Claims 1-4, 6-12, 14-18, 21 and 22 are rejected under 35U.S.C. 103(a) as being obvious over Gebhardt et al. (Patent #5928767) hereinafter Gebhardt in view of Takeuchi et al. (Patent #5744224) hereinafter Takeuchi.

As to claims 1,.9 and 17 Gebhard discloses in Fig.4 and 6 a substrate 80 for mounting at least one die 85a within an integrated circuit (column 57, lines 18-21), comprising: dielectric layer 6 (column 54, lines 51-65) defining a first surface of the substrate, Fig.4a, and having channels therein for addition of circuit material 84, 86, 93 (column 56, lines 39-42), the channels Fig. 6a, b having sides extending to a plane defining the first surface of the substrate and having a bottom beneath the plane defining the first surface of the substrate, and wherein the channels include at least one land area formed from multiple channels (land on intersection of channels (grooves)) 93 and 84 within the substrate 80; and circuit material 5', Fig. 1b deposited within the channels for forming an electrical connection between electrical contacts of the at least one die 85a and electrical terminal lands on the substrate,

except, Gebhardt doesn't explicitly teach the at least one land area forms a shape having non-channel regions within a perimeter of the land area.

Takeuchi discloses in Fig. 1 the at least one land area 10 forms a shape having non-channel regions 12 within a perimeter of the land area 10.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Gebhardt include in his invention that the at least one land

area forms a shape having non-channel regions within a perimeter of the land area, as taught by Takeuchi because Takeuchi teaches that such a configuration would result in the benefit of a thermal stress does not appear (column 2, lines 29-32).

Instant Gebhard, as modified, clearly teaches the Applicant's claimed "at least one land area formed from multiple channels" and "one land area forms a shape having non-channel regions within a perimeter of the land area" structures. However, the examiner notes that a limitation " plating and etching current density of the circuit material deposited within the at least one land area is reduced and dimpling of the circuit material within the at least one land area is reduced or eliminated" are a process limitations in the product claim. Such a process limitations define the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP 2113 and 2173.05(p) and In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985).

As to claims 2, 3,10, 11,18 and 21 Gebhardt, as modified, discloses everything, as discussed above with respect of claim 1, 9 and 17,

except, Gebhardt does not teach the at least one land area is a grid formed from multiple channels within the perimeter of the at least one land area, whereby the circuit material deposited within the perimeter of the at least one land area forms a grid of conductive material as claimed claim 2 (10, 18, 21), and the multiple channels comprise: a first plurality of parallel channels; a second plurality of parallel channels orthogonal to the first plurality of parallel channels in a plane defined by the first surface of the substrate, as claimed claim 3 (11).

Takeuchi discloses in Fig. 1 the at least one land area 10 is a grid formed from multiple channels 14 within the perimeter of the at least one land area 10, whereby the circuit material deposited within the perimeter of the at least one land area forms a grid of conductive material as claimed claim 2 (10, 18,21), and the multiple channels comprise: a first plurality of parallel channels; a second plurality of parallel channels orthogonal to the first plurality of parallel channels in a plane defined by the first surface

of the substrate, as claimed claim 3 (11). [As shown on Fig. 1 each channel 14 has portion of the channel parallel to and orthogonal to a corresponding portion of the another channels in a plane defined by the first surface of the substrate and such satisfied to claim 3.]

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Gebhardt include in his invention that the at least one land area is a grid formed from multiple channels within the perimeter of the at least one land area, whereby the circuit material deposited within the perimeter of the at least one land area forms a grid of conductive material as claimed claim 2 (10, 18, 21), and the multiple channels comprise: a first plurality of parallel channels; a second plurality of parallel channels orthogonal to the first plurality of parallel channels in a plane defined by the first surface of the substrate, as claimed claim 3 (11) , as taught by Takeuchi because Takeuchi teaches that such a configuration would prevent a deformation or a curvature of the chip, column 3, lines 52-54). And more such grid will reduce a plating area of the land.

As to claims 4 and 12 Gebhardt, as modified, discloses substrate, having all of the claimed features as discussed above with respect claim 2 (10),

except, Gebhardt does not teach the perimeter of the at least one land area is a rectangle, whereby a mounting land for a surface-mount component is provided by the circuit material deposited within the at least one land area.

Takeuchi discloses in Fig. 4 the perimeter of the at least one land area is a rectangle, whereby a mounting land for a surface-mount component is provided by the circuit material deposited within the at least one land area. Although Takeuchi teaches rectangle shape of pad for chip component such pads can be used without modifications for surface-mount component.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Gebhardt include in his invention that the perimeter of the at least one land area is a rectangle, whereby a mounting land for a surface-mount

component is provided by the circuit material deposited within the at least one land area to provide robust electrical connection for surface-mount component.

As to claims 6-8, 14-16 and 22 Gebhardt, as modified, discloses substrate, having all of the claimed features as discussed above with respect claim 1 (9, 17),

except, Gebhardt does not teach the at least one land area is multiple channel sub-areas having a common predetermined geometric shape and disposed radially around center of the at least one land area, and further comprising interconnect channels interconnecting the multiple channel sub-areas, whereby the circuit material deposited within the perimeter of the at least one land area forms a circular pattern having voids between the sub-areas, and one of the sub-areas is first circular sub-area disposed at the center of the at least one land area and the remaining sub-areas are circular areas radially disposed around the first circular sub-area, and one of the sub-areas first circular sub-area disposed at the center of the at least one land area and the remaining sub-areas are annular segments radially disposed around the first circular sub-area.

Takeuchi discloses in Fig. 3 the at least one land area 10 is multiple channel sub-areas [sub-areas in Fig. 3 are separated by voids 12] having a common predetermined geometric shape 16 and disposed radially around center of the at least one land area, and further comprising interconnect channels interconnecting the multiple channel sub-areas, whereby the circuit material deposited within the perimeter of the at least one land area forms a circular pattern having voids 12 between the sub-areas, as claimed claim 6 (14), and one of the sub-areas is first circular sub-area disposed at the center of the at least one land area and the remaining sub-areas are circular areas radially disposed around the first circular sub-area, as claimed claim 7 (15), and one of the sub-area is a first circular sub-area disposed at the center of the at least one land area and the remaining sub-areas are annular segments radially disposed around the first circular sub-area, as claimed claim 8,(16) (please see Fig. 3).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Gebhardt include in his invention that the at least one land

area is multiple channel sub-areas having a common predetermined geometric shape and disposed radially around center of the at least one land area, and further comprising interconnect channels interconnecting the multiple channel sub-areas, whereby the circuit material deposited within the perimeter of the at least one land area forms a circular pattern having voids between the sub-areas, as claimed claim 6 (14), and one of the sub-areas is a first circular sub-area disposed at the center of the at least one land area and the remaining sub-areas are circular areas radially disposed around the first circular sub-area, as claimed claim 7 (15) and one of the sub-area is first circular sub-area disposed at the center of the at least one land area and the remaining sub-areas are annular segments radially disposed around the first circular sub-area, as claimed claim 8 (16), as taught by Takeuchi, because Takeuchi teaches that such a configuration would result in the benefit of a thermal stress does not appear (column 2, lines 29-32).

5.2. Claims 5 and 13 are rejected under 35U.S.C. 103(a) as being obvious over Gebhardt in view of Takeuchi and Edwards et al. (Patent #6064576) hereinafter Edwards.

As to claims 5 and 13 Gebhardt, as modified, discloses substrate, having all of the claimed features as discussed above with respect claim 2 (10),

except, Gebhardt does not teach the perimeter of the at least one land area is a circle, whereby a land for a solderball is provided by the circuit material deposited within the at least one land area.

Takeuchi discloses in Fig. 3 the at least one land area is included a circle, whereby a land is provided by the circuit material deposited within the at least one land area. Although Takeuchi does not explicitly teaches the perimeter of the at least one land area is a circle, and a land is the land for a solderball at time the invention was made, it was well know to make shape of the land for solderball as a circle (Please see Edwards , Fig.3).

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made, for Gebhardt include in his invention that the perimeter of the

at least one land area is a circle, whereby a land for a solderball is provided by the circuit material deposited within the at least one land area.

Circle' shape provides reducing of a plating area of the land.

Conclusion

6. ***THIS ACTION IS MADE FINAL.*** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

7.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

7.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YS

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SPE 2841